APS-8M

Asynchronous Port Switch with Internal Modem

Firmware Version 3.x

User's Guide

western™ telematic inc.

Warnings and Cautions:

INSTALLATION INSTRUCTIONS

Secure Racking

If Secure Racked units are installed in a closed or multi-unit rack assembly, they may require further evaluation by Certification Agencies. The following items must be considered.

1. The ambient within the rack may be greater than room ambient. Installation should be such that the amount of air flow required for safe operation is not compromised. The maximum temperature for the equipment in this environment is 45°C. Consideration should be given to the maximum rated ambient.

2. Installation should be such that a hazardous stability condition is not achieved due to uneven loading.

Input Supply

1. Check nameplate ratings to assure there is no overloading of supply circuits that could have an effect on overcurrent protection and supply wiring.

2. When installing 48 VDC rated equipment, it must be installed only per the following conditions:

   A. Connect the equipment to a 48 VDC supply source that is electrically isolated from the alternating current source. The 48 VDC source is to be connected to a 48 VDC SELV source.

   B. Input wiring to terminal block must be routed and secured in such a manner that it is protected from damage and stress. Do not route wiring past sharp edges or moving parts.

   C. A readily accessible disconnect device, with a 3 mm minimum contact gap, shall be incorporated in the fixed wiring.

Grounding

Reliable earthing of this equipment must be maintained. Particular attention should be given to supply connections when connecting to power strips, rather than direct connections to the branch circuit.

No Serviceable Parts Inside; Authorized Service Personnel Only

Do not attempt to repair or service this device yourself. Internal components must be serviced by authorized personnel only.

- **Shock Hazard - Do Not Enter**

Disconnect Power

If any of the following events are noted, immediately disconnect the unit from the outlet and contact qualified service personnel:

1. If the power cord becomes frayed or damaged.
2. If liquid has been spilled into the device or if the device has been exposed to rain or water.

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1. Introduction

WTI's APS-8M Asynchronous Port Switch allows reliable, high-speed connections between PCs, modems, and other devices using dissimilar baud rates, parity, and flow control. The APS-8M supports communication at speeds up to 115.2 Kbps, and features full RTS/CTS hardware handshaking and a 33.6K V.34 internal modem. Lightening-swift data throughput and full flow control make the APS-8M the perfect data switch for today's high speed communications applications.

Versatile Connectivity

Up to seven different devices can be connected to the APS-8M without the need to select a common baud rate or parity. Each port can be individually configured for specific baud rates, parity, handshaking, and various other parameters and options.

Easy Set-Up and Operation

Configuration of the APS-8M is simple. A menu system is used to select communications parameters, and enable or disable options. The APS-8M can easily adapt to the requirements of almost any data communications application.

Password Protected Connection and Command Access

The APS-8M provides two levels of user security; the Supervisor level and the Non-Supervisor level. The Supervisor level, which is intended for use by system managers and other administrators, provides complete access to all port connection / disconnection functions, operating features and configuration menus, and also allows access to any port on the switch. The Non-Supervisor level is ideal for co-location applications, since users are only permitted to view status and connect to the ports allowed by their password.

Internal Modem

The APS-8M features a 33.6K v.34 Internal modem; allowing easy, convenient out-of-band access to configuration and control functions.

Non-Volatile Memory

If power to the unit is lost or interrupted, the APS-8M's non-volatile memory will retain user-defined parameters and port connections.

Modem Communication

The APS-8M can be controlled by a local PC that communicates with the unit via cable, or controlled remotely via external modem. Hyperterminal (or another communications program) is used to send commands to connect ports or display status.

Configuration Backup

Once you have configured the APS-8M to fit your application, parameters and options can be saved to an ASCII text file on your PC. This allows you to quickly restore user-selected parameters if the unit configuration is accidentally altered or deleted. Saved parameters can also be uploaded to other APS-8M units. This allows rapid set-up when several units will be configured with identical or similar parameters.

Typographic Conventions

Throughout this manual, typefaces and characters have been used to denote the following:

^ (e.g. **^X**)	Indicates a control character. For example, the text "**^X**" (Control X) indicates the **[Ctrl]** key and the **[X]** key must be pressed simultaneously.
COURIER FONT	Indicates characters typed on the keyboard. For example, **/E** or **/P 02**.
[Bold Font]	Text set in bold face and enclosed in square brackets, indicates a specific key. For example, **[Enter]** or **[Esc]**.
< >	Indicates required keyboard entries. For Example: **/P <n>**.
[ ]	Indicates optional keyboard entries. For Example: **/W [n]**.

2. Unit Description

2.1. Front Panel

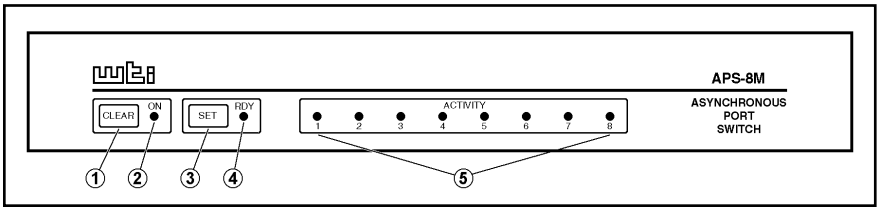

Figure 2.1: Instrument Front Panel

① **CLEAR:** Restarts the APS operating program without changing user-selected parameter settings or breaking port connections.

② **ON:** Lights when AC Power is applied.

③ **SET:** Used to Initialize the APS to factory defaults. To initialize, press and hold both the SET and CLEAR buttons, release only the CLEAR button, and then release the SET button.

Notes:

- During initialization, all port LEDs will flash ON for approximately one half second.
- During initialization, all command-selected parameters will be cleared, and the APS will revert to default parameters.

④ **RDY:** Flashes to indicate unit is operational.

⑤ **ACTIVITY LEDs:** Light when corresponding port is receiving data.

2.2. Back Panel

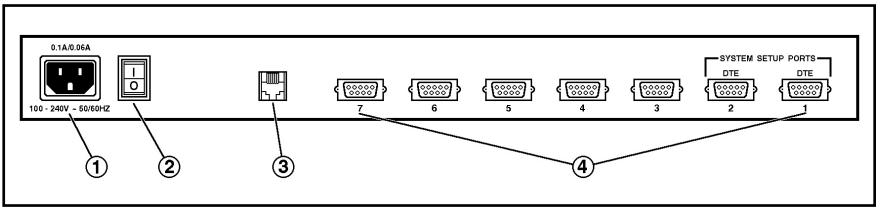

Figure 2.2: Instrument Back Panel

① **Power Cable Receptacle:** AC powered units only. DC units include a terminal block assembly as described in Section 4.1.2.

② **Power Switch**

③ **Modem Port (Line Port):** For connection to your telco line. For information regarding modem configuration, please refer to Section 6.

④ **RS232 PORTS:** For connection to RS232 console ports on user devices. For more information, please refer to Section 4.3 (connection instructions), Appendix A (interface description), and Section 5.2 (Setup Ports).

3. Getting Started

This Quick Start Guide describes a simplified installation procedure for the APS-8M hardware, which will allow you to communicate with the unit in order to demonstrate basic features and check for proper operation.

Note that this Quick Start Guide does not provide a detailed description of unit configuration, or discuss advanced operating features in detail. In order to take full advantage of the complete range of features provided by this unit, it is strongly recommended that you complete the entire Installation and Configuration sections after completing this Quick Start procedure.

3.2. Hardware Installation

1. **Apply Power to the APS-8M:** Refer to the power rating nameplate on the APS-8M back panel, and then connect the unit to an appropriate power source. Make certain to review the safety precautions listed at the beginning of this User's Guide and in Section 4.1, and then set the Master Power Switch on the APS-8M back panel to the ON position.

2. **Connect your Telco Line to the APS-8M:** Use a standard RJ-11 cable to connect your Telco outlet to the Modem (Line) Port, located on the APS-8M back panel. Note that the unit sees the internal modem as Port 8. To connect to the Modem Port, use the procedure described in Section 3.4.

3. **Connect a PC to the APS-8M:** Attach a standard null modem cable from your PC COM port to the Port 1 connector on the APS-8M back panel.

   Note: When the APS-8M is shipped from the factory, communications parameters are set as follows: 9600 bps, RTS/CTS Handshaking, 8 Data Bits, One Stop Bit, No Parity. Although the APS-8M allows these parameters to be easily redefined, for this Quick Start procedure, it is recommended to configure your communications program (e.g. HyperTerminal) to accept the default parameters.

3.3. Connect your Equipment to the Serial Ports

Use an appropriate DB9 cable to connect the RS232 Serial Port on your equipment to the desired Serial Port on the APS-8M

- **PCs and other DTE Devices:** Use a standard null modem cable.
- **External Modems and other DCE devices:** Use a standard serial modem cable.

```
COMMAND MENU:

DISPLAY                                          CONFIGURATION
/S          Port Status                          /F       System Parameters
/SD         Port Diagnostics                     /P [n]   Port Parameters
/W [n]      Port Parameters (Who)                /I       Default and Test
/J          Site ID                              /UF      Upgrade Firmware
/H          Command Menu (Help)                  /CP      Copy Port Parameters
/V          View Password Directory


CONTROL                                          +--------------------+
<Enter>             Enter Command Mode           | n   Port# or name  |
/X                  Exit Command Mode            | *   "all"          |
/C <n> [n]          Connect - Local [Remote]     | |   "or"           |
/D <n | ... | *>    Disconnect Port(s)           | <>  Required entry |
/E <n | ... | *>    Erase Buffer                 | []  Optional entry |
/U                  Send Parameter File          +--------------------+
/UL                 Unlock Invalid Access

/D, /E, /I commands: add /Y to bypass "Sure (y/n)?"
APS>
```

Figure 3.1: The Supervisor Level Help Screen

3.4. Communicating with the APS-8M

The APS-8M command mode allows you to check unit status, change configuration parameters and connect and disconnect ports (including the Modem Port.)

1. **Access Command Mode:** Start your communications program and press **[Enter]**. The "APS>" Command prompt should appear, indicating that you have successfully accessed command mode.

   Note: If a password that permits access to Supervisor Mode has been previously defined, a prompt will be displayed. Key in a Supervisor Level password, and press **[Enter]**. If a Supervisor Level password has not yet been defined, the prompt will not be displayed.

2. **Review the Help Menu:** At the APS Command Prompt, type **/H** and press **[Enter]** to display the Help Menu (Figure 3.1), which provides a basic listing of all APS-8M commands.

3. **Port Status Screen:** Type **/S** and press **[Enter]** to display the Port Status Screen (Figure 3.2), which summarizes conditions at all APS-8M ports.

```
PORT STATUS: APS-M, Version 3.0, Site ID: (undefined)

PORT |       NAME       | CMD ACCESS | STATUS |  MODE  | BUFFER COUNT
-----+-------------------+------------+--------+--------+--------------
 01  | (undefined)       |  Unlocked  |  Free  |  Any   |            0
 02  | (undefined)       |  Unlocked  |  Free  |  Any   |            0
 03  | (undefined)       |  Unlocked  |  Free  |  Any   |            0
 04  | (undefined)       |  Unlocked  |  Free  |  Any   |            0
 05  | (undefined)       |  Unlocked  |  Free  |  Any   |            0
 06  | (undefined)       |  Unlocked  |  Free  |  Any   |            0
 07  | (undefined)       |  Unlocked  |  Free  |  Any   |            0
 08  | Internal_Modem    |  Unlocked  |  Free  |  Modem |            0



Enter /H for command menu.
APS>
```

Figure 3.2: The Port Status Screen

4. **Creating Connections Between Ports:** The APS-8M can perform two different types of port connections; Resident Connections and Third Party Connections.

   a) **Resident Connection:** Your resident port (e.g. Port 1) issues a /C command to connect to a second port.

      i. To connect Port 1 to Port 2, type **`/C 2`** **[Enter]**. While Port 1 is connected, the APS-8M will not recognize commands issued at Port 1. However, the unit will recognize a Resident Disconnect Sequence issued at Port 1 or Port 2.

      ii. Issue the Resident Disconnect Sequence (Logoff Sequence); type **`^X`** (press **[Ctrl]** and **[X]** at the same time).

   b) **Third Party Connection:** Your resident port (e.g. Port 1) issues a /C command to create a connection between two other ports.

      i. To connect Port 2 to Port 3, type **`/C 2 3`** **[Enter]**.

      ii. While Ports 2 and 3 are connected, Port 1 will still recognize APS commands. Type **`/S`** **[Enter]** to display the Port Status Screen. The "STATUS" column should now list Ports 2 and 3 as connected, and Port 1 as "Free".

      iii. Issue a Third Party Disconnect command to disconnect Ports 2 and 3; type **`/D 2`** **[Enter]**. The unit will display the "Are you Sure (y/n)?" prompt. Type **`y`** and press **[Enter]** to disconnect.

      iv. Type **`/S`** **[Enter]** to display the Port Status Screen. The "STATUS" column should now list Ports 2 and 3 as "Free".

5. **Exit Command Mode:** At the "APS>" command prompt, type **/X** and press **[Enter]**. The APS-8M will exit command mode.

6. **Access Command Mode via Modem:** From a PC with a modem and Telco line, dial the number for the line which is connected to the APS-8M's internal modem. Once the connection is established, the unit should send the "APS>" command prompt, indicating that you have successfully accessed command mode.

   Note: If a password that permits access to Supervisor Mode has been previously defined, a prompt will be displayed. Key in a Supervisor Level password, and press **[Enter]**. If a Supervisor Level password has not yet been defined, the prompt will not be displayed.

   a) Type **/H** and press **[Enter]** to display the Help Menu. If desired, you may also wish to repeat the Port Connection / Disconnection examples described in Step 4 above.

   b) When you have finished communicating with the APS-8M unit, type **/X** and press **[Enter]** to exit command mode and terminate the modem connection to the unit.

This completes the Quick Start Guide for the APS-8M. Please proceed to Sections 4 and 5 for complete installation and configuation procedures.

4. Hardware Installation

4.1. Connecting Power to the APS Unit

The APS-8M is available in both AC and DC powered versions. When connecting power, proceed as follows:

CAUTION:

- **Before attempting to install this unit, please review the warnings and cautions listed at the front of the user's guide.**
- **This device should only be operated with the type of power source indicated on the instrument nameplate. If you are not sure of the type of power service available, please contact your local power company.**

4.1.1. AC Powered Units

Plug the power cable (supplied with the unit) into the receptacle on the back panel, and then connect the power cable to an appropriate, grounded outlet. The APS features a self adjusting power supply that automatically adapts to power supplies between 100 and 240 VAC. Press the Power Switch ON. The ON LED should light and the RDY LED should begin to flash.

4.1.2. DC Powered Units

The DC terminal block features two bus inputs as shown in Figure 4.1. This allows the user to connect only one DC power source, or connect two DC power sources where the second source serves as a backup. When connecting the APS-8M to your DC power source, first remove the protective cover from the terminal block, attach the wires from the -48V DC power source to the screw terminals, connect your ground line to the labeled ground screw, and then replace the protective cover.

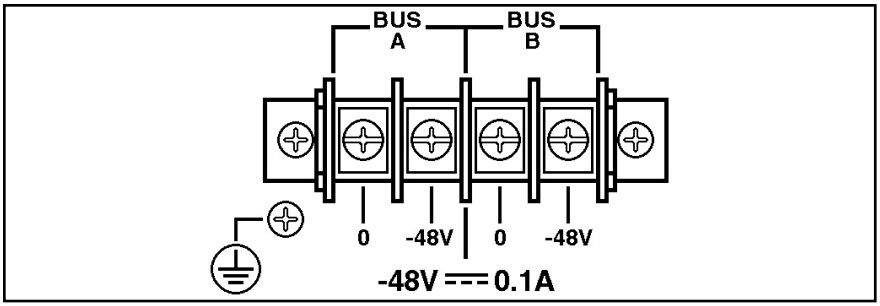

Figure 4.1: Terminal Block Assembly (DC Units Only)

4.2. Connect a Telco Line to the Modem Port

Use a standard RJ-11 cable to connect your Telco outlet to the Modem (Line) Port, located on the APS-8M back panel. Note that the unit sees the internal modem as Port 8.

4.3. Connecting Devices to the APS Serial Ports

APS RS232 Ports one through seven are standard DB9 connectors, configured as DTE Ports, and are similar to a standard serial port on a PC. For a detailed description of the RS232 Port interface, please refer to Appendix A.

1. Access the APS-8M command mode.
2. Determine which RS232 port will be used for connection to the new device (e.g. Port 3).
3. Use an appropriate DB9 cable to connect the RS232 serial port on the device to the selected DB9 port on the APS.
    a) **External Modems and other DCE Devices:** Use a standard serial modem cable.
    b) **PCs and other DTE Devices:** Use a standard null modem cable.
5. Select communication parameters for the port as described in Section 5.

5. Configuration

5.1. Access to the APS Command Mode

When the APS-8M command mode is active, commands can be invoked to select parameters, and connect or disconnect ports.

Note:

- Command mode cannot be accessed from a Buffer Mode Port, Passive Mode Port, or any port that is currently connected to another APS-8M port.
- Configuration commands are not available at any port where the Supervisor Mode has been disabled.
- Supervisor Mode commands can only be invoked by users who have logged in using a password that permits access to Supervisor Mode.

1. Start your communications program (e.g. HyperTerminal). Make certain the APS and the communications program are set for the same parameters (e.g. baud rate, parity, etc.).

2. Access command mode.

   a) **Local Access:** To access command mode from a local PC that is connected to the APS via cable, press **[Enter]**.

      i. There must be no other characters preceding **[Enter]**. If you have already hit other keys, press **[Enter]** twice.

      ii. If a password that permits Supervisor Mode has been previously defined, the password prompt will be displayed. Key in a password that permits Supervisor Mode and press **[Enter]**.

   b) **Modem Access:** To access the command mode via modem, proceed as follows:

      i. Dial the number for the APS-8M's internal modem, or (if present) an external modem connected to one of the APS-8M's RS232 ports.

      ii. If a password that permits Supervisor Mode has been previously defined, the password prompt will be displayed. Key in a password that permits Supervisor Mode and press **[Enter]**.

5.2. System SetUp Ports

Ports 1 and 2 are designated as System SetUp Ports, and will therefore, always permit password protected access to Supervisor Mode.

In order to ensure that access to command functions is always available, Ports 1 and 2 cannot be configured as Buffer Mode or Passive Mode Ports (Buffer Mode Ports and Passive Mode Ports are not able to access command mode.) In addition, Ports 1 and 2 always permit password protected access to Supervisor Mode; the Supervisor Mode cannot be disabled at either of these two ports.

5.3. Password Functions

The APS-8M's password directory allows you to define up to 32 different passwords. These passwords are not only used to protect access to the APS-8M unit, but are also used to determine the type of commands that each user will be allowed to invoke, and the ports that each user will be allowed to connect. This is accomplished by either granting or denying each password's access to Supervisor Mode and specifying permitted ports via the Password Directory.

Passwords that have been granted access to Supervisor Mode are allowed to change configuration parameters and may connect to any APS-8M port. On the other hand, passwords which are denied access to Supervisor Mode are not allowed to change configuration parameters, and are restricted to the ports specifically allowed by that password. Therefore, the password entered during login determines whether or not you will be able to invoke Supervisor Mode commands, and also determines which ports you will be allowed to connect to. Note that the password directory feature is described in greater detail in Section 5.4.1.

Note that once you have defined at least one password that permits access to Supervisor Mode, the APS-8M will display a password prompt whenever you attempt to access command mode. If a valid password, which allows access to Supervisor Mode is entered, the APS-8M will then start up in Supervisor Mode. Supervisor Level commands are summarized in Section 11.3 of this User's Guide.

Notes:

- If you do not define at least one password that permits access to Supervisor Mode, then Supervisor Level commands will be available to all ports, and port access and configuration functions will not be password protected.
- If you wish to restrict users from changing APS-8M configuration parameters or connecting to restricted ports, you must define at least one password that permits access to Supervisor Mode as described in Section 5.4.1.
- If the unit is reset to default parameters, all passwords will be erased, and Supervisor Level commands will be available at all ports, without password protection.

Normally, passwords that permit access to Supervisor Mode can be entered at any port in order to gain access to Supervisor command functions. Note that if you wish to completely deny a port's access to Supervisor Mode (even *with* a Supervisor Password), the Port Parameters menus (/P) can be used to disable the Supervisor Mode at ports 3 through 8. The Supervisor Mode *cannot* be disabled at System SetUp Ports 1 and 2.

5.4. The System Parameters Menu

Before configuring individual ports, the System Parameters should be defined. The System Parameters Menu (/F) allows you to set the Site ID Message, enable/disable the Password on Dial Back Function, set the number of Dial Back Attempts, set the Dial Back Delay Value, and access the menus which are used to define passwords and access rights. All parameters that are defined via the System Parameters Menu are global, and will be applied to all APS-8M ports.

Notes:

- The Site ID message cannot include double quotes.
- Both the Site ID and Password Directory will be cleared if the APS is initialized to default settings.
- The System Parameters Menu is only available in Supervisor Mode.

```
SYSTEM PARAMETERS:

1. Site-ID:                  (undefined)
2. Password on Dial Back:    Off
3. Dial Back Attempts:       3
4. Dial Back Delay:          30 Secs
5. Edit Password Directory




Enter: #<CR> to change,
       <ESC> exit ...
```

Figure 5.1: The System Parameters Menu (/F)

To define System Parameters, you must first access command mode, and then type **`/F`** **[Enter]** to display the System Parameters Menu (Figure 5.1.) The System Parameters Menu allows you to define the following:

1. **Site ID:** Type **`1`** and press **[Enter]**, a prompt will appear. Key in the desired text and press **[Enter]**. The Site ID will be listed on the status and diagnostic screens. (Up to 32 chars.; Default = undefined.)

2. **Password on Dial Back:** Enables/Disables the "Password on Dial Back" feature as described in Section 5.4.2. (Default = Off.)

3. **Dial Back Attempts:** Sets the number of times that the APS-8M will attempt to call the dial back number when the Dial Back feature is properly configured and enabled. For more information on the Dial Back feature, please refer to Section 5.4.2. (Default = 3.)

4. **Dial Back Delay:** Sets the amount of time that will elapse between Dial Back Attempts. For more information on the Dial Back Feature, please refer to Section 5.4.2. (Default = 30 Seconds.)

5. **Edit Password Directory:** Provides access to a series of menus that are used to create, edit, and delete APS-8M passwords as described in Section 5.4.1.

```
EDIT PASSWORD DIRECTORY:

1. Add Name/Password
2. Edit/Delete from List
3. Edit/Delete from Search
4. Delete Entire Directory


Enter: #<CR> to select,
       <ESC> for previous menu ...
```

Figure 5.2: The Edit Password Directory Menu

5.4.1. The Password Directory

APS-8M passwords are defined using the "Edit Password Directory" menu, which is accessed via the System Parameters menu (/F). In addition to assigning command level privileges to each password, the Edit Password Directory function also allows you to determine which ports each password will be allowed to access, and includes prompts that are used to configure several Dial Back parameters. The Password Directory allows for the definition of up to 32 separate passwords.

Note:

- The Edit Password Directory menu is only available when you have logged into command mode using a password that permits access to Supervisor Mode.
- The /V command can also be issued to view the Password Directory.

To activate the Edit Password Directory menu, you must first access the command mode, and then type **`/F`** and press **[Enter]** to display the System Parameters Menu. At the System Parameters Menu, type **`5`** and press **[Enter]** to display the Edit Password Directory menu (Figure 5.2.) The Edit Password Directory Menu offers the following options:

1. **Add Name/Password:** Creates new passwords and assigns Supervisor Mode access and port access rights as described in Section 5.4.1.1.

2. **Edit/Delete from List:** Edits/Deletes passwords. The desired password is selected by scrolling through a list of all passwords as described in Section 5.4.1.2.

3. **Edit/Delete from Search:** Edits/Deletes passwords. The desired password is selected using a search function as described in Section 5.4.1.2.

4. **Delete Entire Directory:** Clears the password directory, and deletes all existing passwords as described in Section 5.4.1.3.

```
ADD NAME/PASSWORD:

1. Name:             (undefined)
2. Password:         (undefined)
3. Dial Back #:      (undefined)
4. Dial Back Mode:   Off
5. Supervisor Mode:  Off
6. Port Access:      None
7. Save Entry

Enter: #<CR> to select,
       <ESC> for previous menu ...
```

Figure 5.3: The Add Name/Password Menu (Defaults Shown)

5.4.1.1. Adding Passwords

The "Add Name/Password" menu is used to create new user accounts and add passwords to the password directory. To access the Add Name/ Passwords menu, activate the Edit Password Directory Menu as described in Section 5.4.2, then type **1** and press **[Enter]**. The Add Name/Password menu will be displayed as shown in Figure 5.3. The Add Name/Password Menu allows you to assign the following parameters:

1. **Name:** Assigns a username to the password. Note that usernames are not required when logging into command mode, and are used for descriptive purposes only.

2. **Password:** After keying in the password, the unit will prompt you to verify the password by re-keying it.

3. **Dial Back #:** Defines the number that the APS-8M will dial when the Dial Back feature is enabled and the unit is contacted via modem. For more information on the Dial Back Mode, please refer to Section 5.4.2.

4. **Dial Back Mode:** Enables/Disables the Dial Back Mode for this password. For more information on the Dial Back Mode, please refer to Section 5.4.2.

5. **Supervisor Mode:** Enables/Disables Supervisor Mode for this password. When Supervisor Mode is enabled, the password will provide access to all configuration menus, and allow connections to all ports. When Supervisor Mode is disabled, the password will not permit access to configuration menus, and will only allow access to ports specifically permitted by the password definition.

   Note: In order to access Supervisor Mode from any given port, the port at which the password is issued must also permit Supervisor Commands.

```
EDIT/DELETE NAME/PASSWORD:

1. Name:            test
2. Password:        (defined)
3. Dial Back #:     5556789
4. Dial Back Mode:  On
5. Supervisor Mode: On
6. Port Access:     1, 2, 3, 4, 5, 6, 7, 8
7. Save Entry
8. Delete Entry

Type: "<"<Enter> previous entry, ">"<Enter> next entry,
      <number><Enter> to selection,
      <ESC> to abort ...
```

Figure 5.4: The Edit/Delete Name/Password Menu (Sample Values Shown)

6. **Port Access:** The ports that this password will be allowed to create connections with. Note that several passwords can provide access to the same port. To select ports, type **6**, press **[Enter]** and follow the instructions in the resulting submenu.

7. **Save Entry:** Note that if you exit from the menu without first saving, the password will not be saved.

5.4.1.2. Editing and Deleting Passwords:

The Edit Password Directory Menu (Figure 5.2) provides two different methods for selecting the password you wish to edit or delete; passwords can either be selected by scrolling through the password list, or by using a search routine. To edit or delete existing passwords, access the Edit Password Directory menu and proceed as follows:

1. Select the account that you wish to edit or delete:

   a) **From List:** To find the desired password from a list of all passwords, type **2**, press **[Enter]**, then follow the instructions in the resulting submenu.

   b) **From Search:** To search for a specific password, type **3**, press **[Enter]**, then follow the instructions in the resulting submenu.

2. **Edit Password:** After finding the desired password, the "Edit/Delete Name/Password" Menu (Figure 5.4) will be displayed. Items 1 through 6 are used to select and change parameters, and function identically to the corresponding items in the Add Name/Password menu. Item 7 is used to save the edited password and parameters. Note that if you exit from the menu without first saving, newly selected parameters will be discarded.

3. **Delete Password:** After finding the desired password, the "Edit/Delete Name/Password" Menu will be displayed. To delete the password, type **8** and press **[Enter]**.

5.4.1.3. Deleting the Entire Password Directory

The Edit Password Directory menu (Figure 5.2) also allows you to delete the entire password directory, rather than accessing each individual password and deleting them one at a time. To delete the Password Directory and clear all passwords, activate the "Edit Password Directory" Menu as describe in Section 5.4.1, type **4** and press **[Enter]**. The unit will then display a "Sure?" prompt and wait for confirmation before proceeding.

Notes:

- Deleted passwords cannot be recovered.
- If the Password Directory is deleted, the password prompt will no longer be displayed, and users will be able to access Supervisor Mode without a password. In order to restrict access to Supervisor commands, you must define at least one password that permits access to Supervisor Mode.

5.4.2. The Dial Back Function

The Dial Back Function provides an additional layer of security when callers attempt to access command mode via modem. When this function is properly configured, callers will not be granted immediate access to command mode upon entering a valid password; instead, the unit will disconnect, and dial a user-defined number before allowing access via that number. If desired, users may also be required to re-enter the password after the APS-8M dials back.

Note that a separate Dial Back Number can be defined for each password, and the feature may also be independently enabled for each password. To enable this function, proceed as follows:

1. Access command mode using a port and password that permit Supervisor Mode. At the command prompt, type **/F** and press **[Enter]** to display the System Parameters menu.

2. **System Parameters Menu:** Note that dial back parameters selected via this menu are global, and will apply to all passwords. Define the following parameters:

   - **Item 2, Password on Dial Back:** (Optional) Determines whether or not the Dial Back Mode will require the answering party to re-enter their password after a Dial Back is performed.
   - **Item 3, Dial Back Attempts:** The number of times the APS-8M will attempt to call the dial back number.
   - **Item 4, Dial Back Delay:** The amount of time the APS-8M will wait between Dial Back attempts.

3. **Edit Password Directory:** From the System Parameters Menu, type **5** and press **[Enter]** to display the Edit Password Directory Menu. At this point, you may either define new passwords that use the Dial Back Function, or alter existing passwords to include the Dial Back Function. The following parameters should be defined in the Add Name/Password Menu or Edit/Delete Password/Name Menu:

   - **Item 3, Dial Back #:** The number that will be called when a Dial Back is performed. This is the number for the password owner's modem.
   - **Item 4, Dial Back Mode:** Enables/Disables the Dial Back function for this password. When enabled, this password will require a dial back to be performed whenever this password user attempts to access the unit via modem.

   Note: In order for new parameters to be applied, you must save each password before leaving the menu.

Dial Back Example:

Assume that the unit is configured as follows:

System Parameters Menu:
- Item 2, Password on Dial Back: **On**
- Item 3, Dial Back Attempts: **3**
- Item 4, Dial Back Delay: **30 Seconds**

Add Name/Password Menu:
- Item 1, Name: **Test**
- Item 2, Password: **test**
- Item 3, Dial Back #: **5551234**
- Item 4, Dial Back Mode: **On**

Given this configuration, the unit would behave as follows :

1. **Password "test" Entered at Modem Port:** Unit confirms that password is valid, then disconnects.

2. **Dial Back:** Unit dials "555-1234" (the Dial Back Number for "test") and waits for the user's remote modem to answer.

3. **Password on Dialback:** When the modem at the Dial Back Number answers, the APS-8M will prompt the user to enter the password before allowing access to command mode.

4. **Dial Back Attempts and Delays:** If the modem does not answer, the unit will then attempt to redial the number three times (Dial Back Attempts), and will pause for approximately 30 seconds (Dial Back Delay) between each redial.

5.5. Port Configuration

5.5.1. Configuration Conventions

When responding to prompts, invoking commands, and selecting items from port configuration menus, note the following:

- To select an item from a Port Configuration menu, key in the number for the item and press **[Enter]**.
- To clear an item in a Port Configuration menu, enter the number for the desired item and press **[Enter]**. When the prompt appears, press **[Space]** and then press **[Enter]**.
- When defining the Port Name, do not use the forward slash character (**/**), double quotes (**"**), the asterisk character (*****), or blank spaces.
- Port Names cannot begin with a number.
- Refer to the instructions in each screen for additional functions available under that screen.
- To exit a menu or prompt without changing its current value, press **[Esc]**.
- Passwords are case sensitive. When defining passwords, note the exact text, including the case of each character.
- If you are configuring the APS-8M unit via modem, communication parameters will not be changed until after you exit from command mode and disconnect from the APS-8M unit.

5.5.2. Port Modes

The APS offers four different port operation modes; Any-to-Any Mode, Passive Mode, Buffer Mode, and Modem Mode. The Port Modes function as follows:

- **Any-to-Any Mode:** Allows communication between connected ports. Any-to-Any Mode Ports can be connected to other Any-to-Any, Passive, Buffer, or Modem Mode Ports by accessing command mode and invoking the /C command (see Section 8.1.1). The Any-to-Any Mode is available to all APS ports, except Port 8 (the Internal Modem Port).
- **Passive Mode:** Allows communication between connected ports, but does not allow access to command mode. Passive Mode Ports can be connected by accessing command mode from a free Any-to-Any or Modem Mode port and invoking the /C command (see Section 8.1.1). The Passive Mode is not available to Ports 1, 2, or 8.
- **Buffer Mode:** Allows collection and storage of data received from connected devices. Collected data can be retrieved by accessing command mode from a free Any-to-Any or Modem Mode Port, and issuing the Connect Command (/C.) Note that the Buffer Mode also allows pass-through communication with the connected device. The Buffer Mode is not available to Ports 1, 2, or 8.
- **Modem Mode:** A Modem Mode port can perform all functions normally available in Any-to-Any Mode, but the Modem Mode also allows definition of a Hang-Up String, Reset String, and Initialization String. Any APS-8M RS232 port can be configured for Modem Mode, and Port 8 (the Internal Modem port) is always configured for Modem Mode.

For more information on Port Modes, please refer to Section 8.

```
PORT PARAMETERS #01:

 1. Port Name:               (undefined)
 2. Baud Rate:               9600
 3. Bits/Parity:             8-None
 4. Stop Bits:               1
 5. Handshake Mode:          RTS/CTS
 6. Port Mode:               Any-to-Any
    64. DTR Output:          Pulse
 7. Supervisor Mode:         Permit
 8. Logoff Character:        ^X
 9. Sequence Disconnect:     One Character Only
10. Timeout Disconnect:      Off
11. Response Type:           Verbose
12. Command Echo:            On
13. Accept Break:            Yes
14. Invalid Access Lockout: Off


Enter: "<" previous port,
       ">" next port,
       <ESC> exit ...
```

Figure 5.5: Port Configuration Menu (Port 1 Shown)

5.5.3. RS232 Port Configuration Menus

The Port Configuration Menus are used to select options for each of the APS-8M's RS232 ports. Parameters selected via these menus will stay in effect until the unit is initialized or the /P command is used to reconfigure the port. After initialization, parameters will revert to the defaults specified by the SetUp Switches.

To select port parameters, proceed as follows:

1. Access command mode. If the password prompt is displayed, key in a password that permits Supervisor Mode.

2. Type **/P**, followed by the number of the port to be configured, and press **[Enter]**. For example, to configure Port 1, type **/P 1 [Enter]**. The Port Configuration menu will appear as shown in Figure 5.5.

   a) If the /P Command is entered without the port number (e.g. **/P [Enter]**), the configuration menu for your resident port will be displayed.

   b) The /P command is only available to passwords that permit access to Supervisor Mode

The Port Configuration menu offers the following options:

1. **Port Name:** (Up to 16 characters) Assigns a name to the port. (Defaults: Ports 1 through 7 = undefined; Port 8 = "Internal_Modem").

2. **Baud Rate:** Selects the baud rate for the port. Can be set to any standard rate from 300 bps to 115.2K bps. (Default = 9600 bps)

3. **Bits/Parity:** (Default = 8-None).

4. **Stop Bits:** (Default = 1).

5. **Handshake Mode:** Selects the handshake format for this port; XON/XOFF, RTS/CTS (hardware), Both, or None. (Default = RTS/CTS).

6. **Port Mode:** Defines the operation mode for this port. (Default: Ports 1 through 7 = Any-to-Any Mode; Port 8 = Modem Mode).

Notes:

- Ports 1 and 2 *cannot* be configured as Passive Mode or Buffer Mode ports.
- Port 8 is always configured for Modem Mode. Port 8 cannot be set to Any-to-Any, Buffer, or Passive Mode.

When Any-to-Any, Passive, or Buffer Mode is selected, the unit will display the DTR Output prompt (item 64) as shown in Figure 5.5. The DTR Output prompt is not displayed when Modem Mode is selected.

64. **DTR Output:** Determines how DTR will react when this port disconnects. DTR can be held low, held high, or pulsed for 0.5 seconds and then held high. In the default state, DTR will pulse for 0.5 seconds and then remain high. For more information on hardware lines, please refer to Appendix A. (Default = Pulse).

```
PORT PARAMETERS #03:

 1. Port Name:               (undefined)
 2. Baud Rate:               9600
 3. Bits/Parity:             8-None
 4. Stop Bits:               1
 5. Handshake Mode:          RTS/CTS
 6. Port Mode:               Modem
    61. Reset String:        ATZ
    62. Init String:         AT&C1&D2S0=1
    63. Hang-Up String:      (undefined)
 7. Supervisor Mode:         Permit
 8. Logoff Character:        ^X
 9. Sequence Disconnect:     One Character Only
10. Timeout Disconnect:      15 Min
11. Response Type:           Verbose
12. Command Echo:            On
13. Accept Break:            Yes
14. Invalid Access Lockout: Off

Enter: "<" previous port,
       ">" next port,
       <ESC> exit ...
```

Figure 5.6: Port Parameters Menu; Modem Mode (Port 3 Shown)

When the Port Mode is set to Modem Mode, the menu will include additional prompts (see Figure 5.6), which are used to define the following:

61. **Reset String:** If necessary, this prompt can re-define the modem reset string, which is sent prior to the Initialization string. (Up to 48 Chars., Default = **ATZ**).

62. **Initialization String:** Defines a command string that can be sent to initialize a modem to settings required by your application. (Up to 48 Characters, Defaults: Port 1 through 7 = **AT&C1$D2S0=1**; Port 8 =**ATM0&C1$D2S0=1**).

63. **Hang-Up String:** Although the APS will pulse the DTR line to hang-up an attached modem, the Hang-Up string is often useful for controlling modems that do not use the DTR line. (Up to 48 Characters, Default = undefined).

Notes:

- When communicating with the APS via modem, communication parameters will not be changed until you exit from command mode and discontinue the modem connection to the unit.
- For a list of basic AT commands for the Internal Modem, please refer to Section 6. For a complete listing of all available AT commands and S-Registers, please refer to the "MT5634 Modem AT Command Set" document in our User's Guide Archive at the WTI web site: http://www.wti.com/guides/guidarch.htm.

7. **Supervisor Mode:** Permits or denies access to Supervisor Mode at this port. When enabled (Permit), and a password that permits Supervisor Mode is entered, the port will allow access to Supervisor Mode commands. When disabled (Deny), the port will *not* enter Supervisor Mode, even when a password that normally permits access to Supervisor Mode is entered. (Default = Permit).

   Note: The Supervisor Mode cannot be disabled at Ports 1 or 2.

8. **Logoff Character:** Defines the Logoff Character for this port. The Logoff Character determines the command(s) or character(s) that must be issued at this port in order to disconnect from a second port (Resident Disconnect). (Default = **^X** (**[Ctrl]** plus **[X]**)).

   Note: When redefining the Logoff Character, make certain to select a character that does not normally occur in your data.

9. **Sequence Disconnect:** Enables/Disables and configures the Resident Disconnect command. This prompt offers the option to either disable the Sequence Disconnect, or select a one character format or a three character format. (Default = One Character). Note the following:

   - When a Resident Connection is initiated, the APS will send a message which lists the connected ports, and displays the one character or three character command that will be required in order to disconnect.
   - The One Character Disconnect sequence is intended for situations where the destination port will ***not*** receive the disconnect command. When the Three Character format is selected, the disconnect sequence ***will*** pass through to the destination port prior to breaking the connection.
   - When the One Character format is selected, resident connections are terminated by entering the selected Logoff Character only. There is no need to press **[Enter]** before and after the Logoff Character when the One Character format is selected.
   - When the Three Character format is selected, the Resident Disconnect Sequence will use the format "**[Enter]LLL[Enter]**", where **L** is the selected Logoff Character.

10. **Timeout Disconnect:** Enables and selects the Timeout Period for this port. If enabled, and the port does not receive or transmit data for the specified Timeout Period, the port will disconnect. In Any-to-Any Mode, Passive Mode, or Buffer Mode, the default setting for this item is "OFF". When the port is set for Modem Mode, the default setting for this item is 15 minutes.

Notes:

- The Timeout Disconnect is also applied to non-connected ports that are left in command mode. If no additional data activity is detected, an unconnected port will exit from command mode when the Timeout Disconnect value expires.
- When connected ports time out and are disconnected, both ports will also exit from command mode.

11. **Response Type:** Selects the type of messages that this port will send in response to commands. The user can select Verbose (English Text), Terse (Numeric / Abbreviation), or Quiet Mode (No Response). (Default = Verbose).

12. **Command Echo:** Enables or Disables the command echo for this port. (Default = On).

13. **Accept Break:** Determines whether the port will accept breaks received from the attached device, and pass them along to a connected port. When enabled, breaks received at this port will be passed to any port that this port is connected to, and sent along to the device connected to the other port. When disabled, breaks will be refused at this port, and hence, not sent to the other port. (Default = Yes)

14. **Invalid Access Lockout:** Enables/Disables the Invalid Access Lockout feature as described in Section 5.5.4. Briefly, the Invalid Access Lockout feature can be used to automatically disable a port when a user-defined number of invalid access attempts are detected. (Default = Off.)

5.5.4. The Invalid Access Lockout Feature

When properly configured and enabled, the Invalid Access Lockout feature will watch all login attempts made at a given port. If the port exceeds the selected number of invalid attempts, then that port will be automatically disabled for a user-defined length of time.

Note that when an Invalid Access Lockout occurs, you can either wait for the Lockout Duration period to elapse, or issue the /UL command to instantly unlock all ports.

> **Note:** The Invalid Access Lockout feature can be individually enabled/disabled at each port.

The Invalid Access Lockout Feature is configured and enabled using the Port Parameters Menu for the desired port. When "Invalid Access Lockout" is selected, the APS-8M will display a submenu which allows you to configure the following parameters:

1. **Lockout Access:** Enables/Disables Invalid Access Lockout at this port.
2. **Lockout Attempts:** The number of invalid access attempts required to trigger the Invalid Access Lockout feature.
3. **Lockout Duration:** The length of time that ports will remained locked when an Invalid Access Lockout occurs. Note that if the duration is set to "0", the port will remained locked until the /UL command is issued.

```
COPY PORT PARAMETERS:

 1. Port Name:
 2. Baud Rate:
 3. Bits/Parity:
 4. Stop Bits:
 5. Handshake Mode:
 6. Port Mode:
    64. DTR Output:
 7. Supervisor Mode:
 8. Logoff Character:
 9. Sequence Disconnect:
10. Timeout Disconnect:
11. Response Type:
12. Command Echo:
13. Accept Break:
14. Invalid Access Lockout:

(Note: ports 1 & 2 will NOT have restricted values changed.)
Enter: parameter # <CR> to define parameter value to copy to all ports,
       -<CR> to remove all values set,
       X<CR> to exit WITHOUT copy,
       <ESC> to copy to ports and exit ...
```

Figure 5.7: The Copy Port Parameters Menu

5.6. Copying Parameters to All Ports

The /CP command (Copy Port Parameters) provides a convenient means for selecting similar parameters for all APS-8M RS232 ports.

When the /CP command is invoked, the unit will display a menu which allows you to select port communication parameters, then copy them to all APS RS232 ports. The Copy Port Parameters menu can be used to set all parameters for all RS-232 Ports, or define only a select group of parameters and then copy them to all ports.

Notes:

- The /CP command is only available in Supervisor Mode.
- The /CP command cannot be used to set Ports 1 and 2 to Passive Mode or Buffer Mode (Port Mode, Item 6.)
- The /CP command cannot be used to disable the Supervisor Mode at Ports 1 and 2 (Supervisor Mode, Item 7.)
- The /CP command cannot be used to change the Port Mode at Port 8 (Internal Modem Port.)

To select common parameters for all APS RS-232 ports, proceed as follows:

1. Access command mode. If the password prompt is displayed, key in a password that permits Supervisor Mode.

2. At the command prompt, type **`/CP`** and press **[Enter]**, the menu shown in Figure 5.7 will be displayed.

3. **Selecting Parameters:** To select parameters to be copied, key in the number for the desired parameter, press **[Enter]**, then follow the instructions in the submenu. Note that it is not necessary to define *all* port parameters, for example, the /CP command could be used to select only the Baud Rate for all ports.

4. **Clear Menu:** After defining several parameters, if you wish to clear the /CP menu and start again, type **`-`** (dash) and press **[Enter]**, the menu will be reset.

5. **Exit Without Copy:** To exit from the Copy Parameters menu without copying selected parameters to all RS232 ports, type **`X`** and then press **[Enter]**. The APS will exit from the Copy Parameters menu and return to the command prompt.

6. **Copy Parameters:** When you have finished selecting parameters, press **[Esc]** to copy the selected parameters to all APS RS-232 Ports and exit from the Copy Port Parameters menu. Note that the APS will display a "Sure" prompt before copying parameters to other ports.

5.7. Save User Selected Parameters

Although this step is optional, it is strongly recommended to save all user-defined parameters to an ASCII file. This will allow quick recovery in the event of accidental deletion or reconfiguration of port parameters. Section 9 describes the procedure for saving configuration parameters to an ASCII file.

6. The Internal Modem

This section lists commonly used AT commands for the APS-8M's internal modem, and briefly describes the procedure for communicating with the internal modem. Please note that although APS-8M Port 8 is the internal modem port, any APS-8M port can also be configured for connection to an external modem.

6.1. Communicating with the Internal Modem

To communicate with the APS-8M's internal modem, proceed as follows:

1. Access the APS command mode as described in Section 5.1.

   Notes:

   - If you log on to the APS-8M using a password that does not permit Supervisor Mode, then you will only be able to connect to Port 8 if your password allows access to that port. Passwords that permit Supervisor Mode will always allow access to all ports.
   - To access the internal modem's command mode from a remote location, you must first dial into an external modem installed at one of the other RS232 ports, and then proceed as described below. The internal modem's command mode cannot be accessed via a remote connection to the internal modem.

2. When the APS> command prompt appears, type **`/C 8`** and press **[Enter]** to connect to the internal modem port (Port 8).

3. When the connection is established, the APS-8M will respond with a message that reads "Connected: 08", and lists the Port Name and currently selected disconnect command.

6.2. Common AT Commands

This section lists some of the most commonly used AT commands for the APS-8M's internal modem. For a complete listing of all available AT Commands and S-Registers, please refer to the "MT5634 Modem AT Command Set" document at http://www.wti.com/guides/guidarch.htm.

Notes:

- Type commands in either upper or lower case. Do not use a combination of upper and lower case characters.
- Use the Backspace key to delete errors.
- All commands begin with the **AT** prefix, and are invoked by pressing **[Enter]**.The only exceptions are **A/** (Repeat Previous Command) and **+++** (Exit to on-line command mode).
- The maximum command length is 40 characters. This does not include the AT Prefix, Carriage Returns, or spaces.
- Default settings are marked with an asterisk (*).

Command Function/Options

Z*n* Reset Modem. Resets modem parameters to default values.

- Z0 Reset modem to profile saved by the last &W command.
- Z1 Same as Z0

D*s* Dials telephone number *s*. Where *s* may be up to 40 characters long and may include the numbers 0-9, *, #, B, C, and D characters and the L, P, T, V, W, S, comma (,), semicolon (;), !, @, ^ and $ dial string modifiers.

Dial String Modifiers:

- L Redial last number. (Must be placed immediately after ATD.)
- P Pulse-dial following numbers in command line.
- T Tone Dial following numbers in command line.
- W Wait for a new dial tone before continuing to dial (X2, X4, X5, X6 or X7 must be selected.)
- , (Comma) Pause during dialing for time set in Register S8.
- ; Return to command mode after dialing. (Place at end of dial string.)
- ! Hook Flash. Causes modem to go on-hook for one half second, then off hook again.
- @ Wait for quiet answer. Causes modem to wait for a ringback, then 5 seconds of silence, before processing the next part of the command. If silence is not detected, the modem returns a NO ANSWER code.

Command		Function/Options
&D*n*		Data Terminal Ready (DTR) Control.
	&D0	Modem ignores true status of DTR signal and responds as if it is always on.
	&D1	If DTR drops while in online data mode, the modem enters command mode, issues an OK, and remains connected.
*	&D2	If DTR drops while in online data mode, the modem hangs up. If the signal is not present, the modem will not answer or dial.
	&D3	If DTR drops, the modem hangs up and resets as if an ATZ command had been issued.
E*n*		Set Modem Command Mode Echo.
	E0	Disable echoing of command mode characters.
*	E1	Enable echoing of command mode characters.
&W*n*		Store Current Modem Configuration.
	&W0	Stores current modem settings in non-volatile memory and causes them to be loaded instead of the factory defaults at power-on or when the ATZ command is invoked.
*	&W1	Clears user default settings from non-volatile memory and causes the factory defaults to be loaded at power-on or following the ATZ command.
+++AT		In-band Escape Sequence. Puts the modem in command mode (and optionally issues a command) while remaining online. Type **+++AT** and up to six optional command characters; then press **[Enter]**. Used mostly to issue the hangup command: +++ATT<CR>.
&Q*n*		Asynchronous Communications Mode.
	&Q0	Asynchronous with data buffering. Same as /N0.
*	&Q5	Error control with data buffering. Same as /N3.
	&Q6	Asynchronous with data buffering. Same as /N0.
	&Q8	MNP error control mode. If MNP error control is not established, the modem falls back according to the setting in Register S36.
	&Q9	V.42 or MNP error control mode. If neither error control method is established, the modem falls back according to the setting in Register S36.

Command	Function/Options	
I*n*	Information Request	
	I0	Display default speed and controller firmware version.
	I1	Calculate and display ROM checksum (e.g., *12AB*.)
	I2	Check ROM and verify the checksum, displaying OK or ERROR
	I3	Display default speed and controller firmware version.
	I4	Display firmware version for data pump (e.g., *94*.)
	I5	Display the board ID: software version, hardware version, and country ID.
	I9	Display the country code.
	I11	Display diagnostic information for the last modem connection, such as link type, line speed, type of error correction / data compression, number of past retrains, etc.
&E*n*	XON/XOFF Pacing Control.	
*	&E12	Disables XON/XOFF pacing.
	&E13	Enables XON/XOFF pacing.

7. The Status Screens

The APS-8M Status Screens display the connection status and communication parameters for the RS-232 ports. Basically, There are four different status screens; The Port Status screen (/S), the Port Diagnostics screen (/SD), the Port Parameters screens (/W), and the View Password Directory screen.

7.1. The Port Status Screen (/S)

The Port Status Screen lists the general status of the RS-232 ports. To display the Port Status Screen, access the command mode and type /S [Enter], the screen will appear as shown in Figure 7.1.

Although the Port Status Screen can be displayed by passwords that permit Supervisor Mode *and* passwords that do not permit Supervisor Mode, note that the resulting screen will appear slightly different, depending upon the Supervisor Mode access rights of the port and password that invoked the /S command. When the /S command is invoked by a user who does not have access to Supervisor Mode, the Port Status Screen will only display the status of those ports that are specifically allowed for the password entered at log in.

```
PORT STATUS: APS-M, Version 3.0, Site ID: (undefined)

PORT |       NAME        | CMD ACCESS | STATUS |  MODE  | BUFFER COUNT
-----+-------------------+------------+--------+--------+--------------
 01  | (undefined)       |  Unlocked  |  Free  |  Any   |            0
 02  | (undefined)       |  Unlocked  |  Free  |  Any   |            0
 03  | (undefined)       |  Unlocked  |  Free  |  Any   |            0
 04  | (undefined)       |  Unlocked  |  Free  |  Any   |            0
 05  | (undefined)       |  Unlocked  |  Free  |  Any   |            0
 06  | (undefined)       |  Unlocked  |  Free  |  Any   |            0
 07  | (undefined)       |  Unlocked  |  Free  |  Any   |            0
 08  | Internal_Modem    |  Unlocked  |  Free  |  Modem |            0


Enter /H for command menu.
APS>
```

Figure 7.1: The Port Status Screen

As shown in Figure 7.1, The Port Status Screen lists the following:

- **Name:** The user-defined name for each port.
- **Command Access:** Indicates if the corresponding port has been disabled by the Invalid Access Lockout feature. If this column reads "Locked", then the defined number of invalid access attempts for this port has been exceeded, and the port has been locked in order to prevent further access attempts. To unlock a port, you must either issue the /UL command to unlock all ports, or wait for the port's user-defined Lockout Duration period to elapse.
- **Status:** The connect status of each port. When the port is connected, this column will list the number of the other APS port connected to this port.
- **Mode:** The user-selected Port Mode. This column will read Any (Any-to-Any), Modem, Passive, or Buffer, depending on the configuration selected for the port.
- **Buffer Count:** Lists the amount of data (in bytes) stored in the buffer for this port.

7.2. The Port Diagnostics Screen (/SD)

The Port Diagnostics Screen provides more detailed information about each port, including most communication parameters. To display the Port Diagnostics Screen, access the command mode and type **`/SD`** **[Enter]**, the screen will appear as shown in Figure 7.2.

Like the Port Status Screen, the Port Diagnostics Screen is also available in both Supervisor Mode and non-Supervisor Mode. Note however, that if the Port Diagnostics Screen command (/SD) is invoked by a password or port that does not permit Supervisor Mode, then the resulting screen will only display status of the ports that are specifically allowed by the password entered at log in.

```
PORT DIAGNOSTICS: APS-M, Version 3.0, Site ID: (undefined)

PORT |       NAME       | STATUS |  BAUD  | COM |  HS  |  MODE  |  BUF  | CTS
-----+-------------------+--------+--------+-----+------+--------+-------+----
 01  | (undefined)       | *Free  |  9600  | 8N1 | RTS  |  Any   |     0 |  H
 02  | (undefined)       |  Free  |  9600  | 8N1 | RTS  |  Any   |     0 |  H
 03  | (undefined)       |  Free  |  9600  | 8N1 | RTS  |  Any   |     0 |  L
 04  | (undefined)       |  Free  |  9600  | 8N1 | RTS  |  Any   |     0 |  L
 05  | (undefined)       |  Free  |  9600  | 8N1 | RTS  |  Any   |     0 |  L
 06  | (undefined)       |  Free  |  9600  | 8N1 | RTS  |  Any   |     0 |  L
 07  | (undefined)       |  Free  |  9600  | 8N1 | RTS  |  Any   |     0 |  L
 08  | Internal_Modem    |  Free  |  9600  | 8N1 | RTS  |  Modem |     0 |  H



Enter /H for command menu.
APS>
```

Figure 7.2: The Port Diagnostics Screen (Defaults Shown)

As shown in Figure 7.2, the Port Diagnostics Screen lists the following:

- **Port:** The Port Number.
- **Name:** The user-defined name for each port.
- **Status:** The connect status for each port. When the port is connected, this column will list the number of the other port that is connected to this port. Note that if this column contains an asterisk, this indicates that the port has accessed command mode.
- **Baud:** The baud rate selected for each port.
- **COM:** The Data Bits, Parity, and Stop Bits selected for each port. For example, "8N1" indicates Eight data bits, No parity, and One stop bit.
- **HS:** The handshaking (flow control) mode for each port.
- **Mode:** The user-selected Port Mode. This column will read Any (Any-to-Any), Modem, Passive, or Buffer, depending on the configuration selected for each port.
- **BUF:** Lists the amount of data (in bytes) currently stored in the buffer for this port.
- **CTS:** The High/Low status of the CTS line at the RS232 interface.

```
PORT PARAMETERS #01:

 1. Port Name:               (undefined)
 2. Baud Rate:               9600
 3. Bits/Parity:             8-None
 4. Stop Bits:               1
 5. Handshake Mode:          RTS/CTS
 6. Port Mode:               Any-to-Any
    64. DTR Output:          Pulse
 7. Supervisor Mode:         Permit
 8. Logoff Character:        ^X
 9. Sequence Disconnect:     One Character Only
10. Timeout Disconnect:      Off
11. Response Type:           Verbose
12. Command Echo:            On
13. Accept Break:            Yes
14. Invalid Access Lockout: Off


APS>
```

Figure 7.3: The Port Parameters Screen (Port 1 Shown)

7.3. The Port Parameters Screens (/W)

The /W command displays more detailed information about an individual APS port. Rather than listing connection information for all ports like the Port Status Screens, the Port Parameters screen lists all defined parameters for a specific port as shown in Figure 7.3.

The /W command is available to both Supervisor Mode and Non-Supervisor Mode ports and passwords. Note however, that if the /W command is invoked by a port or password that does not permit access to Supervisor Mode, then the APS will only display information for your resident port.

7.4. The Password Directory Screen (/V)

The Password Directory Screen (Figure 7.4) lists currently defined parameters for each of the APS-8M passwords. Note that the Password Directory screen will not display actual passwords, and instead, will only indicate whether or not a password has been defined for each username.

The Password Directory Screen is only available when the Supervisor Mode is active, and cannot be displayed by ports or passwords that do not permit Supervisor Access. The APS-8M allows for the definition of up to 32 separate passwords.

```
Name              Password          Dial Back #                    DB  SA
-------------------------------------------------------------------------
admin             (defined)         5556789                        On  On
drafting          (defined)         (undefined)                    Off Off
engineering       (defined)         (undefined)                    Off On
finance           (defined)         5559900                        On  Off
hr                (defined)         (undefined)                    Off Off
manufacturing     (defined)         (undefined)                    Off Off
marketing         (defined)         5551234                        On  Off
sales             (defined)         5559876                        On  Off
service           (defined)         5554321                        Off Off
test              (defined)         5556789                        On  On



Reached End of Directory.
APS>
```

Figure 7.4: The Password Directory Screen (Sample Values Shown)

As shown in Figure 7.4, the Password Directory Screen lists the following:

- **Name:** The username for each password. Note that the username is not entered during login, and is used for descriptive purposes only.
- **Password:** If a password has been defined for the corresponding username, this column will read "defined"
- **Dial Back Number:** The number that will be called if the Dial Back Function is enabled for this password, and the user attempts to access the APS-8M via modem. For more information on the Dial Back Function, please refer to Section 5.4.2.
- **DB (Dial Back):** Indicates whether or not the Dial Back Function is enabled. This column will read "On" if the Dial Back function has been enabled for the corresponding password.
- **SA (Supervisor Access):** Indicates whether or not the password will provide access to the Supervisor Mode. This column will read "On" if the corresponding password has been granted permission to access Supervisor Mode.

8. Operation

8.1. Any-to-Any Mode

Any-to-Any Mode Ports can be connected to other Any-to-Any, Passive, Buffer, or Modem Mode Ports by accessing command mode and issuing the /C Command. All ports can be configured for the Any-to-Any Mode.

8.1.1. Port Connection and Disconnection

The APS provides communication between devices without the requirement that both devices use the same communication parameters. This allows you to connect devices that use dissimilar baud rates, parity, handshake, and etc. The APS converts data rates and other parameters, eliminating the need to select common parameters for all connected devices.

8.1.1.1. Connecting Ports

Two different types of connections can be made between APS ports; Resident Connections and Third Party Connections.

- **Resident Connections:** Your resident port issues a /C command to connect to a second port. For example, Port 4 issues the /C command to connect to Port 5.
- **Third Party Connections:** (Supervisor Mode Only) Your resident port issues a /C command to create a connection between two other ports. For example, Port 1 is your resident port, and Port 1 issues a command to connect Port 2 to Port 3.

Notes:

- Third Party Connections can only be initiated by ports and passwords that permit access to Supervisor Mode.
- If a port has accessed command mode using a password that does not permit Supervisor Mode, then that port will only be able to connect to the ports that are specifically allowed by the password definition.

To Connect ports, proceed as follows:

1. Access command mode as described in Section 5.1. If the Password Prompt is displayed, enter a password that permits Supervisor Mode.

2. Invoke the /C command to connect the desired ports.

   a) **Resident Connect:** To connect your resident port to another port, type **`/C xx`** **[Enter]**. Where **`xx`** is the number or name of the port you want to connect. The APS will display the numbers of the connected ports, along with the command sequence that will be required in order to disconnect the two ports.

      Example: To connect your resident port to Port 8, type **`/C 8`** **[Enter]**.

   b) **Third Party Connect:** (Supervisor Mode Only) To connect any two ports (other than your resident port), type **`/C xx XX`** **[Enter]**. Where **`xx`** and **`XX`** are two port names or numbers. The APS will display the numbers of the two connected ports.

      Example: To connect Port 5 to Port 6, access command mode using a password and port that permit Supervisor Mode, and then invoke the following command: **`/C 5 6`** **[Enter]**.

When the /C command specifies the port name, it is only necessary to enter enough letters to differentiate the desired port from other ports. Type an asterisk (**`*`**) to represent the remaining characters in the port name. For example, to connect your resident port to a port named "SALES", the connect command can be invoked as **`/C S*`**, providing no other port names begin with the letter "S".

8.1.1.2. Disconnecting Ports

There are three different methods for disconnecting ports, the Resident Disconnect, the Third Party Disconnect, and the No Activity Timeout. Providing the Timeout feature is enabled, a No Activity Timeout will disconnect resident ports *or* third party ports.

> **Note:** When Any-to-Any Mode, Buffer Mode, or Passive Mode are selected, Option 64 in the Port Parameters Menu determines how the DTR signal will react when the port disconnects. The DTR signal can either be held low, held high, or pulsed and then held high.

To disconnect ports, proceed as follows:

1. **Resident Disconnect:** Disconnects your resident port from another port. For example, if you are communicating via Port 3, and Port 3 is connected to Port 4, a Resident Disconnect would be used to disassociate the two ports. The APS offers two different Resident Disconnect command formats; the One Character Format and the Three Character Format (for more information, please refer to Section 5.5.3.):

   a) **One Character (Default):** When the One Character Disconnect Sequence is selected, simply enter the selected Logoff Character once (Default = **^X** (**[Ctrl]** plus **[X]**)). Note that it is *not* necessary to enter a carriage return before or after the Logoff Character.

   b) **Three Characters:** Uses the format **[Enter]LLL[Enter]**, where **L** is the Logoff Character. For example, if the Logoff Character is "**+**", then the three character disconnect sequence would be **[Enter]+++[Enter]**.

   c) If the default Resident Disconnect Sequence is not compatible with your application, both the command format and Logoff Character can be redefined via the Port Configuration menus, as described in Section 5.5.3.

2. **Third Party Disconnect:** (Supervisor Mode Only) The /D command is issued from your resident port to disconnect two third party ports. For example, if your Resident Port is Port 1, a Third Party Disconnect could disconnect Port 3 from Port 4.

   a) The /D command uses the format: **/D xx XX [Enter]**, where **xx** and **XX** are the numbers of the ports that you wish to disconnect.

   b) The /D (Disconnect) command can only be invoked by a port that permits Supervisor Mode.

   c) The /D command can specify both connected ports, or either of the two ports. For example, if Port 1 is your resident port, any of the following commands can be used to disconnect Port 3 from Port 4:

/D 3 4 [Enter]
or
/D 3 [Enter]
or
/D 4 [Enter]

3. **No Activity Timeout:** Providing the Timeout Disconnect feature is enabled at either connected port, a No Activity Timeout can disconnect Resident Ports, *or* Third Party Ports.

   a) **RS232 Ports:** To configure the Timeout Disconnect Feature for the RS232 Ports, invoke the /P command to display the Port Configuration Menu for the desired port as described in Section 5.5.3. Option 10 enables and defines the Timeout Disconnect Feature.

   b) When the Timeout Disconnect Feature is enabled, the port will automatically disconnect if no data is received for the defined Timeout Period.

Notes:

- When connected ports time out, both ports will exit command mode after disconnecting.
- When an unconnected port is left in command mode and no additional data activity is detected, the port will automatically exit command mode when its defined timeout value elapses.

8.1.2. Defining Hunt Groups

A Hunt Group creates a situation where the APS will scan a group of ports and connect to the first available port in the group. Hunt Groups are created by assigning identical or similar names to two or more ports. Hunt Groups can be defined using Any-to-Any, Passive, Buffer, or Modem Mode Ports.

1. Access command mode. If the password prompt is displayed, key in a password that permits Supervisor Mode.

2. Invoke the /P command to access the Port Configuration Menu for the desired Port(s). For example, to configure Port 4, type **`/P 4`** **[Enter]**.

3. From the Port Configuration Menu, select item 1 to define the Port Name.

4. Repeat steps 2 and 3 above to assign identical names to the other ports in the Hunt Group. For example, a series of ports in a group could all be named "SERVER".

5. To connect to the next available port in the hunt group, invoke the /C command using the port name to specify the desired group. For example, **`/C SERVER`** **[Enter]**.

6. Your port will be connected to the first available port in the group. If all ports are presently connected, the APS will respond with a "BUSY" message.

7. It is only necessary to enter enough letters of the port name to differentiate Hunt Group ports from other ports. Type an asterisk (*) to represent the remaining characters in the port name. For example, to connect your resident port to the first available port in a group of ports named "SALES1", "SALES2", and "SALES3", the connect command can be invoked as **`/C S*` [Enter]**, providing no other port names begin with the letter "S".

Hunt Group port names must be unique. Otherwise, ports with similar names will also be included in the Hunt Group.

Hunt Group Example 1:

1. Ports 1 and 2 are configured as Modem Mode ports, and external modems are installed at both ports. Port 1 is named "MODEM1" and Port 2 is named "MODEM2".

2. Your resident port is Port 4. To connect to the first available external Modem, access command mode and type **`/C MODEM*` [Enter]**.

Hunt Group Example 2:

1. Ports 3, 4, and 5 are Any-to-Any Mode ports. All three ports are named "SERVER".

2. Your resident port is Port 1, and you want to connect Port 2 to the first available server, access command mode and type **`/C 2 SERVER` [Enter]**.

8.2. Passive Mode

Passive Mode Ports function the same as Any-to-Any Mode Ports, but do not allow access to command mode. A Passive Mode Port can communicate with other ports, but cannot enter command mode, and therefore cannot invoke commands to redefine port parameters, display status, and etc.

Passive Mode Ports can be connected by accessing command mode from a free Any-to-Any Mode or Modem Mode Port, and invoking the Third Party Connect or Resident Connect Command as described in Section 8.1.1. Passive Mode ports will not buffer data, except during baud rate conversion.

Notes:

- A Passive Mode Port is not allowed to access command mode.
- In order to ensure supervisor access to important command functions, the Passive Mode is not available to Ports 1 and 2 (SetUp Ports).
- Port 8 (Internal Modem Port) cannot be configured as a Passive Mode Port.

8.3. Buffer Mode

Ports configured as Buffer Mode ports will collect data from the connected device and store it in the APS's statically allocated memory. Each port features a fixed length, fixed position data buffer.

The Buffer Mode allows collection of data from various devices without the requirement that all devices use the same communication parameters (e.g. baud rate, parity, etc.).

Notes:

- Buffer Mode Ports cannot access command mode.
- In order to ensure supervisor access to important command functions, the Buffer Mode is not available to Ports 1 and 2 (SetUp Ports).
- Port 8 (Internal Modem Port) cannot be configured as a Buffer Mode Port.

8.3.1. Reading Data from Buffer Mode Ports

To retrieve data from Buffer Mode Ports, you must first determine which port buffers contain data. To check port buffers for stored data, access command mode and type **`/S`** **[Enter]** to display the Port Status Screen.

To retrieve data from buffer memory, go to a free Any-to-Any or Modem Mode Port, access command mode (Supervisor Mode), and issue the /C command using the following format:

`/C xx` **[Enter]**

Where **`xx`** is the number or name of the port buffer to be read.

If the port's buffer is empty, the APS will send a message which reads "Connected xx, Buffer Empty"; where "xx" is the port number. If the buffer contains data, the APS will display a prompt that offers four options:

Next Screen: To scroll through data one screen at a time, press the [Space] bar. Each time the space bar is pressed, the next full screen of data will be sent.

- **Scroll All:** To send all data without pausing, press **[1]**.
- **Skip/Connect:** To connect to the buffer port without sending stored data, press **[2]**.
- **Erase/Connect:** To connect to the buffer port and erase stored data, press **[3]**. Note that buffered data will be erased immediately and will not be sent.

  Note: All four of these options also allow pass-through communication with the device connected to the Buffer Mode port.

To clear data from the buffer, use the Erase/Connect option, or go to a free Any-to-Any or Modem Mode Port with Supervisor Mode capability, and issue the /E (Erase Buffer) command using the following format:

`/E xx` **[Enter]**

Where **`xx`** is the number or name of the port buffer to be cleared.

8.3.2. Port Buffers

The Status Screen lists the amount of Buffer Memory currently used by each port. The APS uses buffer memory in two different ways, depending on the user-selected port mode.

- **Any-to-Any, Passive, and Modem Mode Ports:** When two ports are communicating at dissimilar baud rates, the buffer memory prevents data overflow at the slower port.
- **Buffer Mode Ports:** Stores data received from connected devices. The user issues a connect command (/C) from an Any-to-Any Mode or Modem Mode port to retrieve data.

If the Status Screen indicates an accumulation of data, the /E (Erase Buffer) command can be invoked to clear the buffer.

8.4. Modem Mode

In addition to allowing data transfer, the Modem Mode also provides additional functions specifically related to modem communication. A Modem Mode Port can perform all functions normally available in Any-to-Any Mode. The Modem Mode is available to all RS232 ports. In addition to allowing configuration of the internal modem, the Modem Mode also simplifies the process of connecting an external modem to Ports one through seven.

> **Note:** Port 8 (the internal modem port) is always configured for the modem mode. Port 8 cannot be configured as an Any-to-Any Mode, Buffer Mode or Passive Mode port.

When the Modem Mode is selected, the port configuration menu (command /P) will display three additional prompts, which allow the user to re-define the modem reset string, initialization string, and hang-up string. When Modem Mode is selected for a port that permits Supervisor Mode, you should also define at least one password that permits Supervisor Mode in order to discourage unauthorized access to higher command functions.

Normally, when a call is received, the unit will prompt the caller to enter a password. The APS allows three attempts to enter a valid password. If the correct password is not entered in three attempts, or if the user does not respond to the password prompt within 30 seconds, the modem will disconnect. Passwords are defined by invoking the /F command as described in Section 5.4.

Notes:

- When a Modem Mode Port exits command mode, or the DCD line is lost while command mode is active, the APS will pulse the DTR line to the modem. The unit will then send the user-defined modem command strings to make certain the modem is properly disconnected and reinitialized.
- All APS-8M RS232 ports can use both the unit's internal modem and external modem(s) installed at another RS232 port, providing that the port password allows access to the desired modem port. To call out, invoke the /C command to connect to the port, and then access the modem as you normally would.
- If desired, the Invalid Access Lockout Feature can be configured to completely shut down a port after a user-defined number of invalid access attempts are detected. For more information on the Invalid Access Lockout Feature, please refer to Section 5.5.4.

9. Saving and Restoring Configuration Parameters

After the APS-8M has been properly configured, parameters can be downloaded and saved as an ASCII text file. Later, if the configuration is accidentally altered, the file with the saved parameters can be uploaded to automatically reconfigure the unit without the need to manually re-assign each parameter.

Saved parameters can also be uploaded to other APS-8M units. This allows rapid set-up when several units will be configured with the same parameters, providing that all units are using the same APS-8M firmware version.

The "Save Parameters" procedure can be performed from any communications program (e.g. HyperTerminal, ProComm, Crosstalk, etc.), that allows downloading of ASCII files.

9.1. Sending Parameters to a File

1. Start your communications program and access the APS command mode. If the password prompt is displayed, enter a password that permits access to Supervisor Mode.

2. When the APS command prompt appears, type **`/U`** and press **[Enter]**. The APS will prompt you to configure your communications program to receive an ASCII download.

    a) Set your communications program to receive an ASCII format download, and the specify a name for a file that will receive the saved parameters (e.g. APS8M.PAR).

    b) Disable the Line Wrap function for your terminal emulation program. This will prevent command lines from being broken in two during transmission.

3. When the communications program is ready to receive the file, return to the APS-8M's Save Parameter File menu, and press **[Enter]** to proceed with the download. APS-8M parameters will be saved on your hard drive in the file specified in Step 2 above.

4. The APS-8M will send a series of ASCII command lines which specify the currently selected APS parameters. The last line of the file should end with a "**`/G-00`**" command. When the download is complete, press **[Enter]** to return to the "APS>" command prompt.

9.2. Restoring Saved Parameters

This section describes the procedure for using your communications program to send stored parameters to the APS.

1. Start your communications program and access the APS command mode; if the password prompt is displayed, enter a password that permits access to Supervisor Mode.

2. Configure your communications program to upload an ASCII text file.

3. Upload the ASCII text file with the saved APS parameters. If necessary, key in the file name and directory path.

4. Your communications program will send the specified ASCII text file to the APS-8M. When the communications program is finished with the upload, make certain to terminate the Upload mode.

   Note: If the APS detects an error in the parameters file, it will respond with the "Invalid Parameter" message. If an error message is received, carefully check the contents of the parameters file, correct the problem, and then repeat the upload procedure.

5. If the parameter upload procedure is successful, the APS will send a confirmation message, and then return to the "APS>" command prompt. Type **`/S`** and press **[Enter]**, the APS Status Screen will be displayed. Check the Status Screen to make certain the unit has been configured with the saved

10. Upgrading APS-8M Firmware

When new, improved versions of the APS-8M operating firmware become available, the /UF (Upgrade Firmware) function can be used to update the APS-8M unit to the new firmware version. Updates can be uploaded to the unit via SetUp Ports one and two, or via the internal modem port (Port 8). To install a firmware update, proceed as follows:

> **Note:** All other ports will be disabled during the firmware upgrade procedure.

1. Obtain the update file. Firmware modifications can either be mailed to the customer on a 3.5" diskette or CDROM, or downloaded from WTI via modem. Place the diskette in your diskette drive and/or copy the file to your hard drive.

2. Access the APS command mode. If the password prompt is displayed, key a password that permits Supervisor Mode. The Upgrade Firmware feature is only available in Supervisor Mode.

3. When the APS command prompt appears, type **`/UF`** and then press **[Enter]**. The APS-8M will display a screen which offers the following options:

   a) **Continue Upload and Keep Current Parameters:** To proceed with the upgrade, while retaining current, user-defined parameters, type **`1`** and press **[Enter]**. All parameter settings will be restored when the upgrade is complete.

   b) **Continue Upload and Default System:** To proceed with the upgrade, and reset parameters to default settings, type **`2`** and press **[Enter]**. When the upgrade is complete, all parameters will be set to default values. Note that if the Firmware Upgrade is performed via modem, Modem Port parameters will not be defaulted until after you hang-up and disconnect from the unit.

   c) **Abort Upload:** To cancel the upgrade and return to the command prompt, type **`3`** and press **[Enter]**.

4. Use your communication program's (e.g. HyperTerminal's) upload function to transfer the upgrade firmware to the unit. Select ASCII file format, and then specify the filename and directory location where the firmware upgrade file resides.

   Note: The Upload function will time-out after one minute of inactivity. If the function times out, type **1** and press **[Enter]** to continue, or press **[Esc]** to abort.

5. If the upload is successful, the APS-8M will prompt the user to continue the upgrade or abort.

   a) **Upgrade:** To continue with the upgrade, type **1** and press **[Enter]**. APS-8M will erase the previous firmware, move new firmware from data flash to program flash memory, calculate and store the new checksum, and reboot. Do not attempt to reconnect to the APS-8M until the RDY indicator blinks to indicate the process is complete.

   Note: Do not turn off power to the APS-8M unit while the upgrade is in process.

   b) **Abort:** To abort the procedure, type **2** and press **[Enter]**.

6. **Incomplete Upload:** If the upload is interrupted, times-out, or if the file is corrupted during transfer, the APS-8M will display a screen which asks for user confirmation before proceeding. To proceed, type **1** and press **[Enter]**, then return to Step 4 above.

7. **Emergency Recovery:** In the rare event that the APS-8M operating system becomes corrupted during installation, front panel indicators will blink five times and the unit will automatically switch to Emergency Recovery Mode. Please contact WTI Customer Service for further instructions.

When firmware upgrades are available, WTI will provide the necessary files via modem or mailed diskette. At that time, an updated Users Guide or addendum will also be available.

11. Command Reference Guide

11.1. Command Conventions

The commands described in this section conform to the following conventions:

- **Slash Character:** Most APS commands begin with the Slash Character (**/**).
- **Apply Command to All Ports:** When the asterisk character is entered as the argument of the **/D** command (Disconnect Port), or the **/E** command (Erase Buffer) the command will be applied to all ports. For example, to erase all port buffers, type **/E * [Enter]**.
- **Port Name Wild Card:** It is not always necessary to enter the entire port name. Port names can be abbreviated in command lines by entering the first character(s) of the name followed by an asterisk (*****). For example, a port named "SERVER" can be specified as "**S***". Note however, that this command would also be applied to any other port name that begins with the letter "S".
- **Suppress "Sure?" Prompt:** When the **/D** (Disconnect Port), **/E** (Erase Buffer), or **/I** (Default and Test Unit) commands are invoked, the **/Y** option can be included in the command line to override the "Are you Sure (y/n)?" prompt. For example, to disconnect Port 8 without displaying the "Sure?" prompt, type **/D/Y 8 [Enter**].
- **Enter Key:** All commands are invoked by pressing **[Enter]**.
- **Command Mode:** APS-8M Ports will only recognize commands when the command mode has been activated. The command mode can be accessed from a free Any-to-Any or Modem Mode Port. To access the command mode, proceed as described in Section 5.1.
- **Connected Ports:** When two ports are connected, most APS-8M commands will not be recognized by either of the connected ports. The only exception is the Resident Disconnect Sequence (Default = ^X ([Ctrl] plus [X])).
- **Configuration Menus:** To exit from most configuration menus, you must press **[Esc]**. The only exception to this rule is the Copy Parameters Menu. For more information on the Copy Parameters Menu, please refer to Section 5.6.

11.2. Command Response

When commands are sent to the APS-8M, the unit can respond with either verbose (English Text) or terse messages (numeric / abbreviated). In the default state, all ports will send verbose command responses.

After the unit is installed and configured, the port configuration command (/P) can specify an individual response format for each port. In addition to the Terse and Verbose response modes, the port configuration commands can also select the Quiet Mode. When the Quiet Mode is selected, the port will not send messages in response to commands.

The table below summarizes the various response messages for both the Terse and Verbose modes.

Terse	Verbose
0	OK
0	RAM Test Passed
1	Connected *
2	Busy
3	Disconnected
4	Invalid Command
5	Are You Sure (Y/N) ?
6	Invalid Parameter
7	Invalid Syntax
8	Invalid Access
9	Enter Site ID:
A	Aborted
B	Enter Password:
C	Invalid Password
D	RAM Test Failed at *
E	Inactivity Timeout, Disconnected
F	Data in Buffer from Previous Connection ... Re-Enter Logoff Sequence to Purge Buffer.
G	Asleep

* These verbose Response Messages include additional information not provided by terse Response Messages.

11.3. Command Summary

Function	Command Syntax	Command Availability	
		Supervisor	Non-Supervisor
Enter Command Mode	**[Enter]**	X	X
Exit Command Mode	**/X [Enter]**	X	X
Help Menu	**/H [Enter]**	X	X
Display Site ID	**/J [Enter]**	X	X
Display Port Status	**/S [Enter]**	X❶	X❶
Display Port Diagnostics	**/SD [Enter]**	X❶	X❶
Display Port Parameters (Who)	**/W [n] [Enter]**	X	X❷
Display Password Directory	**/V [Enter]**	X	
Set System Parameters	**/F [Enter]**	X	
Set RS232 Port Parameters	**/P <x> [Enter]**	X	
Copy RS232 Port Parameters	**/CP [Enter]**	X	
Connect	**/C <x> [x] [Enter]**	X	X❸
Resident Disconnect❹	**^X**	X	X
Third Party Disconnect❺	**/D[/Y] <x> [x] [Enter]** **/D[/Y] * [Enter]**	X	
Unlock All Ports (Invalid Access)	**/UL [Enter]**	X	
Erase Buffer	**/E[/Y] <x> [x] [Enter]** **/E[/Y] * [Enter]**	X	
Default & Test	**/I[/Y] [Enter]**	X	
Save Parameters	**/U [Enter]**	X	
Upgrade Firmware	**/UF [Enter]**	X	

❶ Supervisor Mode displays parameters for all ports; Non-Supervisor Mode only displays parameters for ports allowed by Port Password.

❷ Ports and passwords that do not permit access to Supervisor Mode can only view parameters for the ports that are specifically allowed by the password entered at log in.

❸ Ports and passwords that do not permit access to Supervisor Mode are not allowed to perform a Third Party Connect.

❹ Resident Disconnect: Disconnects your resident port from another port. Note that the Resident Disconnect Sequence can be redefined via the Port Configuration Menus.

❺ Third Party Disconnect: Disconnects two or more nonresident ports. Must be issued from a third port where Supervisor Mode is active.

11.4. Command Set

This section provides more detailed information on all APS-8M commands, sorted alphabetically by name.

[Enter] Enter Command Mode

In order to set parameters or connect ports, you must first access command mode as described in Section 5.1. When command mode is inactive (port asleep), the port will only respond when the **[Enter]** key is pressed without any characters preceding it. If you have defined at least one password that permits access to Supervisor Mode, the unit will require a password before allowing access to command mode.

Availability: Supervisor Mode / Non-Supervisor Mode

Format: **[Enter]** (Press **[Enter]** twice if other characters have already been typed.)

Response: The Port Status Screen will be displayed, followed by the command prompt.

^X Resident Disconnect Sequence

The Resident Disconnect Sequence is issued to disconnect your resident port from another port. For example, if you are communicating via Port 3, and Port 3 is connected to Port 4, the Resident Disconnect Sequence would be used to disconnect Port 3 from Port 4. Although the default Resident Disconnect Sequence is **^X** (**[Ctrl]** plus **[X]**), the command format and Logoff Character can also be redefined via the Port Configuration Menus. Note that a three character disconnect command can also be selected.

Availability: Supervisor Mode / Non-Supervisor Mode

Format: ^X

Response:

Verbose: The APS will send the "Disconnected" message, followed by the Port Status Screen.

Terse: 3

/C Connect

Establishes a bi-directional connection between two ports. For more information and command line examples, please refer to Section 8.1. There are two types of port connections:

- **Resident Connect:** If the /C command specifies one port name or number, your resident port will be connected to the specified port.
- **Third Party Connect:** If the /C command specifies two port names or numbers, the unit will connect the two ports indicated. A Third Party Connect command must be issued from a third port where Supervisor Mode is active. Passwords and ports that do not permit Supervisor Mode *cannot* initiate a Third Party Connect.

Note:

- Passwords and ports that *do not* permit Supervisor Mode can only connect to the ports that are specifically allowed by the password entered at log in.
- Passwords and ports that permit Supervisor Mode can connect to any free APS-8M port.

Availability: Supervisor Mode / Non-Supervisor Mode

Format: `/C <x> [x] [Enter]`
Where **x** is the number or name of the port(s) to be connected.

Response:

Verbose: Connected **xx**, when a Resident Connection is initiated, the APS will also display the currently selected Resident Disconnect Sequence for your port.

Terse: 1

/CP Copy RS232 Port Parameters

Allows quick set-up when all RS232 ports will be configured with the same or similar parameters. When the /CP command is invoked, the APS will display a menu that is used to select common port parameters, which can then be copied to all APS RS232 ports. Note that the Copy Command will not change restricted parameters at Ports 1, 2, and 8. For more information, please refer to Section 5.6.

Availability: Supervisor Mode Only

Format: `/CP [Enter]`

Response: Displays Copy Parameters Menu

/D Third Party Disconnect

Invoke the /D command at your resident port to disconnect two other ports. The /D command cannot be used to disconnect your resident port. To disconnect your resident port, issue the Resident Disconnect Sequence or wait for the Timeout Period to elapse (if enabled).

Availability: Supervisor Mode Only

Format: **`/D[/Y] <x> [x] [Enter]`**

Where:

- **`/Y`** (Optional) suppresses the "Sure?" prompt.
- **`x`** Is the number or name of the port(s) to be disconnected. To Disconnect all ports, enter an asterisk.

Response:

Verbose: "Are you Sure (y/n)?", if Y, unit will respond with "Disconnected".

Terse: 5, if Y, unit will respond with 3.

Example: To disconnect Port 2 from Port 3 without the "Sure?" prompt, access command mode using a port and password that permit Supervisor Mode, and type one of the following commands:

`/D/Y 2 [Enter]` or **`/D/Y 3 [Enter]`**

/E Erase Buffer

Erases data from the buffer for a specified port or several ports. Note that erased data *cannot* be recovered.

Availability: Supervisor Mode Only

Format: **`/E[/Y] <x> [x] [Enter]`**

Where:

- **`x`** Is the number or name of the port buffer(s) to be cleared. To erase buffers for all ports, enter an asterisk.
- **`/Y`** (Optional) Suppresses the "SURE? (Y/N)" prompt.

Response:

Verbose: "Are You Sure (y/n)?", if Y, the unit will respond with "OK".

Terse: 5, if Y, the unit will respond with 0.

Example: To clear the buffer for Port 3, access command mode using a port and password that permit Supervisor Mode, and type **`/E 3 [Enter]`**.

/F Set System Parameters

Displays a menu which is used to define the Site ID message and other global parameters. Also allows access to the "Add Password" function. For more information, please refer to Section 5.4.

Availability: Supervisor Mode Only

Format: **`/F`** **[Enter]**

Response: Displays System Parameters Menu

/H Help

Displays a Help Screen, which lists all APS-8M commands along with a brief description of each command.

Availability: Supervisor Mode / Non-Supervisor Mode

Format: **`/H`** **[Enter]**

Response: Displays Help Screen. Note that the Supervisor Mode Help Screen differs from the Non-Supervisor Mode Help Screen.

/I Default and Test

Tests internal memory and initializes the unit with the default parameters specified by the SetUp Switches.

> **CAUTION: When /I is invoked, the APS will revert to the parameters specified by the SetUp Switches. Command selected parameters will be lost.**

Availability: Supervisor Mode Only

Format: **`/I[/Y]`** **[Enter]**

Where **`/Y`** is a command option used to suppress the "Sure?" prompt.

Response:

Verbose: "Are You Sure (y/n)?", if Y, memory test and initialization begins.

Terse: 5, if Y, memory test and initialization begins.

/J Display Site ID

Displays the user-defined Site I.D. message.

Availability: Supervisor Mode / Non-Supervisor Mode

Format: /J [Enter]

Response: Displays Site I.D. Message

/P Set RS232 Port Parameters

Displays a menu which allows the user to select options and parameters for the selected port. Section 5.5.3 describes the procedure for defining port parameters.

Availability: Supervisor Mode Only

Format: `/P [x]` [Enter]

Where **`x`** is the number or name of the port to be configured. If the port number or name is not specified, the APS-8M will display the configuration menu for your resident port.

Response: The Port Parameters Menu is displayed.

/S Display Port Status

Displays the Port Status Screen, which lists current conditions and parameters for all ports. When the Supervisor Mode is active, the /S command will display the current status of all APS-8M Ports. If the Supervisor Mode is *not* active, then the /S command will only display status information for the ports that are specifically allowed by the password entered at log in. For more information on the Port Status Screen, please refer to Section 7.1.

Availability: Supervisor Mode / Non-Supervisor Mode

Format: `/S` [Enter]

Response: Displays Port Status Screen

/SD Display Port Diagnostics

Provides more detailed information regarding the operational status of each port. If your password and port permit Supervisor Mode, the /SD command will display status information for all APS-8M ports. However, if your password or port *do not* permit Supervisor Mode, then the /SD command will only display information for the ports specifically allowed by your password. For More information on the Port Diagnostics Screen, please refer to Section 7.2.

Availability: Supervisor Mode / Non-Supervisor Mode

Format: `/SD` [Enter]

Response: Displays Port Diagnostics Screen

/U Save Parameters

Sends configuration parameters to an ASCII text file as described in Section 9.

Availability: Supervisor Mode Only

Format: `/U` [Enter]

Response: The APS-8M will send a series of command lines.

/UF Upgrade Firmware

When new versions of the APS operating firmware become available, this command is used to update the existing firmware as described in Section 10. Note that this command will only function at the internal modem port (Port 8) and at Setup Ports One and Two.

Availability: Supervisor Mode Only

Format: `/UF` [Enter]

Response: The APS will display a menu which offers the options to retain existing APS parameters, default parameters or abort the upgrade procedure.

/UL Unlock All Ports

Unlocks all ports that have been deactivated by the Invalid Access Lockout Function. When the /UL command is invoked, the APS-8M will unlock all RS232 ports that are currently in the locked state. For more information on the Invalid Access Lockout Function, please refer to Section 5.5.4.

Availability: Supervisor Mode Only.

Format: `/UL` [Enter]

Response: The APS-8M will unlock all RS232 Ports.

/V Display Password Directory

Displays the Password Directory as described in Section 7.4. Note that the /V command will not display actual passwords, but will instead read "defined" or "undefined."

Availability: Supervisor Mode Only.

Format: `/V` [Enter]

Response: The unit will display the Password Directory Screen.

/W Display Port Parameters (Who)

Displays detailed configuration information for an individual port. Ports with User Level command capability cannot display parameters for other ports. If you have logged into command mode using a port and password that permit Supervisor Mode, the /W command can display information for any APS-8M port. However, if you have logged into command mode using a port or password that do not permit Supervisor Mode, the /W command will only display information for your resident port. For more information, please refer to Section 7.3.

Availability: Supervisor Mode / Non-Supervisor Mode

Format: `/W [x]` [Enter]
Where **`x`** is the Port number or name. If the "**`x`**" argument is omitted, parameters for your resident port will be displayed.

Response: Displays port parameters.

Example: To display parameters for a port named "SERVER", access the Command Mode from a port with Supervisor Level command capability, and type **`/W SERVER`** **[Enter]**.

/X Exit Command Mode

Exits command mode. When issued at the Net Port, also ends the telnet session. Note that exiting from command mode will not terminate port connections.

- Any-to-Any Mode: Exits command mode.
- Modem Mode: Disconnects and resets modem, hang-up message is sent, hardware line to modem drops for 500 ms, and modem reset string is sent.

Availability: Supervisor Mode / Non-Supervisor Mode

Format: `/X` [Enter]

Response: Disconnected

A. RS232 Port Interface

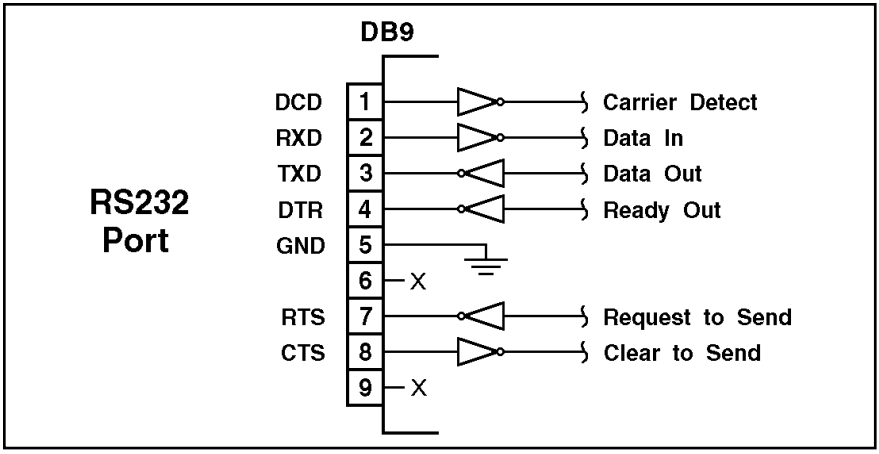

Figure A.1: RS232 Port Hardware

DCD and DTR hardware lines function as follows:

1. When connected:

   a) If either port is set for Modem Mode, the DTR output at either port reflects the DCD input at the other end.

   b) If *neither* port is set for Modem Mode, DTR output is held high (active).

2. When not connected:

   a) If the port is set for Modem Mode, upon disconnect DTR output is pulsed for 0.5 seconds and then held high.

   b) If the port is *not* set for Modem Mode, DTR output is controlled by the DTR Output option (Parameters Menu, Option 74). Upon disconnect, Option 74 allows DTR output to be held low, held high, or pulsed for 0.5 seconds and then held high.

B. Specifications

RS232 Port Interface: Seven (7) RS232 serial inputs use DB9 connectors configured as DTE ports

Internal Modem Interface: RJ11 connectors for connection to your telco line

Coding: Asynchronous, 7/8 bits ASCII.

Parity: Even, Odd, None

Stop Bits: 1 or 2.

Data Rate: 300 to 115.2K bps (standard rates).

Flow Control: XON/XOFF, RTS/CTS, Both, or None.

Timeout: No activity timeout disconnects port. 1, 5, 10, 15, 30 seconds, 1, 5, 15, 30, 90 minutes.

Memory: Stores Parameters and captured data. Non-volatile 32K SRAM buffer memory per port.

Break: Accept Break or Refuse Break

LEDs: On, Ready, Activity (for each RS232 Port).

Temperature: 0°C to 45°C (operating)

Power:

AC Version: IEC-32 Inlet, 115/230 VAC, 50/60 Hz, 5 watts

DC Version: Terminal Strip, -48 VDC, 0.2 Amp Max.

Size: 1.7" High x 17.15" Wide x 6.8" Deep (One Rack Unit)

Weight: 8 lbs. shipping weight

Humidity: 10 to 90% RH, Non-Condensing

Venting: Side vents are used to dissipate heat generated within the unit. When mounting the unit in an equipment rack, make certain to allow adequate clearance for venting.

C. Customer Service

Customer Service hours are from 8:00 AM to 5:00 PM, PST, Monday through Friday. When calling, please be prepared to give the name and make of the unit, its serial number and a description of its symptoms. If the unit should need to be returned for factory repair it must be accompanied by a Return Authorization number from Customer Service.

WTI Customer Service
5 Sterling
Irvine, California 92618

Local Phone: (949) 586-9950
Toll Free Service Line: 1-888-280-7227
Service Fax: (949) 457-8138

Email: service@wti.com

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March, 2005
Part Number: 13202, Revision: D

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E. Regulatory Statements

FCC Part 15 Regulation

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

> **WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment**

FCC Part 68 Statement

General Requirements For All Equipment:

This equipment complies with Part 68 of the FCC rules. On the back cover of this equipment is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. See installation instructions for details.

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company.

If this equipment (analog modem) causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with this equipment, for repair or warranty information, please contact Western Telematic, Inc. at 1-800-854-7226. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this equipment does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

EMC, Safety, and R&TTE Directive Compliance

The CE mark is affixed to this product to confirm compliance with the following European Community Directives:

- Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility;

  and
- Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits;

  and
- Council Directive 1999/5/EC of 9 March on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

This product meets the applicable Industry Canada technical specifications

The Ringer Equivalence Number is an indication of the maximum number of devices allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the RENs of all the devices does not exceed five

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